

CLAIMS

- 7 1. Process for the vapor deposition of layers of a material on a substrate (10) which extends generally in a plane, characterized in that it comprises:
- a step consisting in placing the substrate (10) in a duct (6) made of a refractory material and swept by the gaseous compounds necessary for the deposition, this duct (6) being interposed between the substrate (10) and first (8) and second (9) heating means located on either side of the plane of the substrate (10) and
  - 15 - a step consisting in heating the substrate (10) by virtue of the radiation from the heat of the duct (6), which is itself heated by the first (8) and second (9) heating means.
- 20 2. Process according to claim 1, characterized in that it comprises a step consisting in placing at least one heat shield (14, 15) around the first (8) and second (9) heating means.
- 25 3. Process according to one of the preceding claims, characterized in that it comprises a step consisting in generating a temperature gradient perpendicular to the plane of the substrate (10) and oriented in a first direction.
- 30 4. Process according to claim 3, characterized in that it comprises a step consisting in reversing the direction of the temperature gradient with respect to the first direction.
- 35 5. Process according to one of the preceding claims, characterized in that it comprises a step consisting in creating a flow of a gas which is inert with respect to all of the materials included in the reactor and with respect to the material to be deposited and to the gases flowing in the duct (6).

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6. Reactor for the vapor deposition of layers of a material on a substrate (10) which extends mainly in a plane, comprising first (8) and second (9) heating means located on either side of the plane of the substrate (10), characterized in that it furthermore comprises a duct (6), made of a refractory material and swept by the gaseous compounds necessary for the deposition, this duct (6) being interposed between the substrate (10) and the first (8) and second (9) heating means.

7. Reactor according to claim 6, characterized in that the first (8) and second (9) heating means consist of bare resistive elements.

8. Reactor according to either of claims 6 and 7, characterized in that the duct (6) has a rectangular cross section and comprises two plates forming lower (37) and upper (38) walls which are horizontal and parallel to the plane of the substrate (10) in the position that it occupies during the deposition.

9. Reactor according to one of claims 6 to 8, characterized in that it comprises at least one heat shield (14, 15) around the first (8) and second (9) heating means.

10. Reactor according to claim 9, characterized in that the assembly consisting of the duct (6), the first (8) and second (9) heating means and each heat shield (14, 15) is placed in a tube (3).

11. Reactor according to claim 10, characterized in that the duct (6) is held in place in the tube (3) so as to be free of any contact with the tube (3).

12. Reactor according to either of claims 10 and 11, characterized in that gas may be made to pass via the outlet of the duct 6 between the internal space of the duct (6) and the space lying between the duct (6) and the tube (3), so as to balance the pressure on the walls (37, 38, 39, 40) of the duct (6).

13. Reactor according to claim 12, characterized in that the walls (37, 38, 39, 40) of the duct (6) have a thickness of less than or equal to one millimeter.

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14. Reactor according to one of claims 8 to 13, characterized in that the first (8) and second (9) heating means consist of a graphite strip or band placed flat, parallel to the lower (37) and upper (38) walls of the duct (6), in a suitable geometry so that, in the deposition zone, the deviations from the mean temperature on that surface of the substrate (10) which is intended for the deposition are less than 3°C.

15. Reactor according to one of claims 8 to 14, characterized in that the first (8) and second (9) heating means are positioned, outside the duct (6) each at a distance of 1 to 3 mm from one of the lower (37) or upper (38) walls, respectively.

16. Reactor according to one of claims 6 to 15, characterized in that the first (8) and second (9) heating means may be raised to different temperatures.

17. Reactor according to one of claims 6 to 16, characterized in that the first (8) and second (9) means form only a single heating device placed all around the duct (6).

18. Reactor according to one of claims 6 to 17, characterized in that the first (8) and second (9) heating means are placed in the region of the deposition zone.

19. Reactor according to one of claims 6 to 18, characterized in that the heating means (8, 9) are supplied with a voltage of less than or equal to 230 volts.

20. Reactor according to one of claims 6 to 19, characterized in that the duct (6) is internally lined, in the hottest parts, continuously with a secondary duct made of refractory material.

21. Reactor according to one of claims 6 to 20, characterized in that the first (8) and second (9) heating means are offset with respect to each other in the longitudinal direction of the duct (6).

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